POTENTIAL APPLICATION OF HYPERBARIC OXYGEN IN RENAL DISEASES

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Abstract:
BACKGROUND: Hyperbaric oxygen (HBO2) reduces inflammation, stimulates wound repair and angioneogenesis, preserves intracellular ATP, maintains tissue oxygenation, increases antioxidant enzymes and heals tissue hypoxia and hypoxemia. It has antibacterial activity and immunosuppressive effects. These properties are not utilized in renal disease
MATERIALS AND METHODS: Published papers about HBO2 and renal diseases were reviewed with use of Medline search Database (1966-2006).The paper reviews the complications of renal diseases and dialysis, clinical applications of HBO2 and its effect on renal disease
RESULTS: Haemodialysis increases patient's susceptibility to bacterial infection, and causes oxidative stress, pain, calcific uremic arteriolopathy, uremic polyneuropathy, fatigue and cognitive dysfunctioning. However, HBO2 was used successfully to treat calcific uraemic arteriolopathy, and was used in many cases of acute renal failure. HBO2 decreases the degree of first to second stage pulmonary hyperhydration and hepatic encephalopathy. The peritoneal dialysis combined with forced diuresis and HBO2 were used successfully to managing patients with pyoperitonitis. HBO2 depresses cell-mediated immunity that makes it a good candidate to be tested in acute renal rejection and autoimmune renal diseases. Because HBO2 showed beneficial effect in optic and peripheral neuropathy it might has similar therapeutic effect on neuropathy associated with chronic renal failure. HBO2 was used for treatment of osteoradionecrosis, chondronecrosis, osteonecrosis, osteomylitis and bone ischemia. Therefore, HBO2 could be used as part of management of uremic osteodystrophy. Clearly HBO2 might play a role in the management of acute renal failure, autoimmune renal diseases, glomerulonephritis, nephrotic syndrome, chronic renal failure neuropathy and osteopathy, and fatigability
CONCLUSIONS: the various biological activities and therapeutic applications of HBO2 encourage testing its possible benefit in renal diseases.